



## GCSE Product Design Revision Key Terms/ Words

### A-Z

#### **Acrylic**

A type of plastic commonly used in DT projects. It belongs to the thermoplastic family and its full name is Polymethyl methacrylate.

#### **Aesthetics**

An appreciation of whether an object is pleasing or not. This is usually about how good the object looks but it can also be related to its smell, texture, taste of an object etc

#### **Annotated sketches**

These are design drawings that include written explanations or notes to help the designer to communicate his/ her ideas to the client. These notes can include a range of information such as, colour, size, shape or the type material (s) from which the product will be made.

#### **Appearance**

How it looks, the finishes that you apply, colour, size, weight etc.

#### **ANTHROPOMETRICS**

This relates to detailed dimensions or measurements of the human body. Designers must think carefully about this when designing and making a product for example, what the most suitable height for a classroom chair is for a primary school child in year 3 or what the best height is for a dining room table.

#### **Blow Moulding**

Blow moulding is a manufacturing process by which hollow plastic parts are formed

#### **B.S.I. ( The British Standards Institute )**

The British Standards Institute is an organisation that produces guidelines or minimum standards which many materials and products must reach. All standards are given a number that helps you to identify them, rather like a registration number on a car. For example, BS4163 relates to safety guidelines for design and technology departments in schools.

#### **C.A.D 'Computer Aided Design'**

A programme on a computer used for design work. The CAD programme we use is called '2D Design'.

#### **C.A.M 'Computer Aided Manufacture'**

A method of making a product using a machine controlled by a computer.

### **CNC 'Computer Numerically Controlled'**

The machines used in CAM are CNC. Data is sent to the machine in the form of numbers

### **Consumer group**

These are the different types of people who buy the product such as parents buying toys for children.

### **Consumer**

The intended user or buyer of a product. We are all consumers. However, we have different factors which influence our choice. These include cost and the different requirements/ needs we have for the product.

### **Consumer Association**

This is an independent association that produces reports on products and services.. They produce a magazines every month e.g. *Which?* Magazine. They report on the best and worst products on the market.

### **Components**

The individual parts that make up a product.

### **CONSUMER or END USER**

This is the person(s) who will ultimately decide if the product is what they needed, without their needs the designer (you and me) would not have to make the product; therefore they are very important people

### **Die Cutting**

Metal, paper, or other material shaping process in which a metal die with sharp edges is pressed into the material to cut it. The metal die is the cutter which will be specifically designed for the net it is cutting out.

### **DISASSEMBLY**

This is a form of research where you take a product apart to find out how it is made and how it works

### **The design process in 12 stages**

- 1) **Idea** - all new products start with an idea.
- 2) **Design Brief** – what it is, who needs it, why they need it and how they will use it.
- 3) **Research** = e.g. talk to people who might use your product or study existing products on sale in the shops
- 4) **Design Specification** - A detailed list of things that the product must achieve if it is to be successful. An "it must" list.
- 5) **Proposals** - A collection of ideas and designs for your product

6) **Development** - Includes modelling, building prototypes and making modifications

7) **Evaluation** To check whether the product meets the design specification

### 8) **Manufacturer's Specification**

Precise construction details, quality control procedures, costings

9) **Plan the Production Process** Plan the order work will happen in, make a timeline for production.

10) **Manufacture** - Make it

**Final Testing and Evaluation** - Check the product works and meets the specifications

**Marketing** - Since it works, you can start selling it

### **Design brief**

A concise written statement, which sets out the task, the problem to be solved. It should explain clearly what you are going to design.

### **Design specification**

A detailed list of things, which the product must achieve if it is to be successful. Example

1) My product must have no sharp edges, Cost, appearance, manufacture, maintenance, size, materials, tools, equipment, finish, user, time plan, tolerances, ergonomics, environment and safety.

### **Design**

The process of designing and making something is called the design process

### **Designers**

Designers communicate their ideas through drawings. The drawings include annotated sketches to explain details. These drawings are used in meetings with clients to explain concepts and ideas.

### **Electrical resistance**

The ability of a material to prevent the flow of electricity. `Wood resists electricity much more than metal. Resistance is measured in 'Ohms'. This is the Ohms symbol  $\Omega$

### **ENHANCEMENT REDERING**

This is when you add shading or colour and texture to make a drawing look 3-dimensional

### **Finishes – for protection and appearance/ looks.**

Types of finishes are painting, plastic coating, polishing and lacquering. In food it may include icing, cream, fruit or glazing. In textiles it may include over-locking, hemming, water-proofing or fire-proofing.

### **Form**

An object which is three-dimensional as opposed to a shape which is two-dimensional. For example, a cube is a form; a square is a shape

## Function

The purpose and use of a product

## HEALTH AND SAFETY

Safety is very important for the person making the product and the person using the product. How you use tools etc. the clothes you wear while working, the working environment and risk assessments are all to be considered.

## ICT = Information Communication Technology

Using the computer, the internet, 2-d design, CD-ROM's, etc.

## ISOMETRIC

A method of producing a 3D drawing using 30 degree angles.

## Materials

These can be classified into plastics, metals, wood, paper, boards, composites and smart materials, ceramics in resistant materials. In food you can classify materials into proteins, fats, carbohydrates, vitamins and minerals. In textiles materials/ fabrics can be classified into either, woven, knitted or bonded fabrics.

## Physical property or properties of materials:

The properties of materials are the way they look, feel and behave.

Material	Uses	Properties include
cotton	Clothes, sheets, tablecloths	Durable, absorbent, strong
eggs	Give strength to food like quiche/ thicken sauces	They set when heated Can be added to sauces
Thermosetting plastics	Electrical fittings and pan handles	Resist heat and fire
Nitinol ( a smart material) Shape memory alloy	Bendy glasses/ spectacles	Can be shaped when cool but returns to a remembered shape when heated

## Market research

We do market research to find out about a product (s) that is similar to the one we intend to design and make. This helps you to get ideas about what the end user likes, dislikes, needs and or prefers about a particular product.

## Marketing

This is the process of promoting/ trying to sell goods through advertising and packaging .

## Modelling

We use modelling as a way of trying to decide, or make up our minds about our different ideas, as they progress. Making a range of drawings to solve a problem is a form of two-dimensional modelling. Making models or prototypes out of card or foam is a form of three-dimensional modelling.

## Manufacture

A person or company that makes products to sell.

### **MDF 'Medium Density Fibreboard'**

A material made from wood pulp mixed with resin. This is pressed into large sheets.

### **Nets**

A flat development which when cut out and scored forms a net. Nets are used for the packaging of most products. Nets are manufactured using a printer and a die cutter. They can be manufactured by hand using a solid line for cutting and a dashed line for scoring.

### **PRESSURE GROUP**

A group that applies political pressure to companies and governments when they disagree with them.

### **Perspective**

This is a way of showing distance in a drawing or painting. When drawing perspective we are creating an illusion of distance. When you look up a street and see the path and lamp posts getting smaller as they get further away you are seeing distance. To draw them you use perspective.

### **Production schedule**

Time plan and order of how you will produce your product. This can be produced as a flow chart and you must show in sequence the order of each task and how long it will take. This is especially important with mass production

### **Product Analysis**

Analysing different aspects of a product, e.g. aesthetics, function, and environmental impact, to find out it's good and bad points.

1. Function- what it is used for, disassembling or taking apart to see how it works
2. Form- the shape and look of the product
3. Ergonomics- is about how easy the product is to use-safe, comfortable, fit well
4. Cost- is it value for money, hoe the cost compares to similar existing products
5. Competition-how a product performs compared with similar existing products
6. Environment-if the design and manufacture are environmentally friendly
7. Materials- what materials have been used

### **Prototype**

This is a product that has been modelled from one of your design ideas. You make prototypes as part of the development stage of your project. This helps you to test whether your product will be successful or whether it needs further modification or changes to improve it.

### **Production**

#### **One-off**

Also known as job production. This involves designing and making single products usually for a special order (commission).

#### **Batch production**

Also known as small scale or low volume production . This is where small amounts/ quantities of the same product are made in groups.

## **Mass production**

Also known as repetitive flow or volume production . This involves producing large amounts of the same/ identical products.

## **Polystyrene**

A type of thermoplastic. We use it in the vacuum forming machine.

'Expanded polystyrene' is another version of this plastic and is used in packaging materials.

## **Packaging**

Packaging protects, preserves( keeps fresh) and promotes ( advertises ) the product it contains. These are called the 3 P's by people in the packaging industry.

**-Protection** – when a product is being transported from the factory to the shops

**-Preservation** – especially for food as all foods begin to go off when they are exposed to oxygen/ air

**-Promotion** – designers and manufacturers use striking colours, catchy slogans, prize offers and exciting images or pictures to attract you to buy the product

## **Quality Control ( QC )**

The checks a manufacturer does to make sure that his products are made to a good and safe standard.

## **Quality assurance ( QA )**

The guarantee, given by manufacturers, that products meet standards of quality

## **RECYCLE or recycling**

Materials such as glass, plastic, metal or card that can be re-used again to make the same or different products

## **Resources**

The materials, time, equipment and skills needed for making a product

## **RENEWABLE**

Materials that that can be replaced naturally or the use of sources like sunlight or wind power.

## **Research**

This is finding out about, or gathering information to help you design and make your project.

## **Types of research**

1. Picture research
  2. Collecting people's opinions
  3. Visits
  4. Writing letters to ask for information
  5. Reading, including using the Internet
- Product analysis, or analysis of particular components or processes

## **Systems**

Systems have various parts that work together to perform/ do a function. They are made up of input, process and output

### **Input**

This is a list of all the information, materials, foods, equipment, energy and other resources that you need to carry out the task

### **Process**

This is what's done with all the inputs during the completion of the task. This could include measuring, mixing, cooling or heating.

### **Output**

This is the result of the process acting on the input- in other words, the final result of the process

### **Feedback**

This is simply checking or monitoring the progress of the product at different stages and allows problems to be fixed at the early stages.

## **Sustainable development**

Designing and making products that are recyclable, longer lasting or bio-degradable, and therefore less harmful to the environment or people.

## **SCALE**

A method of producing images/objects in different sizes by shrinking down or expanding all of the dimensions. E.g. 1:2, 1:5, 2:1 etc.

## **Thermoplastic**

A thermoplastic is any plastic that can be shaped again and again by heating such as PVC, acrylic and polystyrene

## **Thermosetting plastic**

A thermosetting plastic is any plastic that once formed can no longer be re-shaped by heat.

## **Vacuum forming machine**

A machine used to heat plastic sheet before sucking it around a mould. The plastic then forms into an exact copy of the mould.